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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/852,847	05/11/2001	Shinji Ohuchi	OKI.234	5682

7590 12/05/2003

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EXAMINER

LEWIS, MONICA

ART UNIT	PAPER NUMBER
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2822

DATE MAILED: 12/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/852,847

Applicant(s)

OHUCHI ET AL.

Examiner

Monica Lewis

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AW

-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 18-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 18-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 October 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

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DETAILED ACTION

1. This action is in response to the amendment filed September 11, 2003.

Response to Arguments

2. Applicant's arguments with respect to claims 18-27 have been considered but are moot in view of the new ground(s) of rejection.

Specification

3. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 18-20 and 22-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Prior Art Drawings in view of Fukui et al. (U.S. Patent No. 6,100,594) and Park et al. (U.S. Publication No. 2002/0089043).

In regards to claim 18, Applicant's Prior Art Drawings disclose the following:

a) a semiconductor element (601) having a circuit forming surface (For Example: See Figure 21);

b) a wiring (604) disposed on said circuit forming surface (For Example: See Figures 21 and 22);

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c) a sealed bump electrode (602) connected to said wiring (For Example: See Figure 21 and 22);

d) sealed bump electrode having an exposed surface (For Example: See Figure 21); and

e) a ball electrode (603) disposed on said exposed surface of said bump electrode (For Example: See Figure 21).

In regards to claim 18, Applicant's Prior Art Drawings fail to disclose the following:

a) sealed confronting surface of said circuit forming surface.

However, Fukui et al. ("Fukui") discloses a sealed confronting surface (For Example: See Figure 1). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Applicant's Prior Art Drawings to include a sealed confronting surface as disclosed in Fukui because it aids in permitting a second device to be mounted (For Example: See Column 5 Lines 5-13, Column 6 Lines 27-58).

Additionally, since Applicant's Prior Art Drawings and Fukui are both from the same field of endeavor, the purpose disclosed by Fukui would have been recognized in the pertinent art of Applicant's Prior Art Drawings.

b) wiring disposed on the side of the semiconductor element.

However, Park et al. ("Park") discloses wiring (30) disposed on the circuit forming surface and on the side of the semiconductor element (For Example: See Figure 3). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Applicant's Prior Art Drawings to include wiring disposed on the circuit forming surface and on the side surface as disclosed in Park because it aids in providing an electrical connection to various components (For Example: See Paragraph 37).

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Additionally, since Applicant's Prior Art Drawings and Park are both from the same field of endeavor, the purpose disclosed by Park would have been recognized in the pertinent art of Applicant's Prior Art Drawings.

In regards to claim 19, Applicant's Prior Art Drawings disclose the following:

a) a plurality of electrodes on said circuit forming surface (For Example: See Figure 21).

In regards to claim 20, Applicant's Prior Art Drawings fails to disclose the following:

a) wiring on a side surface has an end that is sealed.

However, Park discloses wiring disposed on the side of the semiconductor element that is sealed (For Example: See Figure 3). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Applicant's Prior Art Drawings to include wiring disposed on a side surface that has an end that is sealed as disclosed in Park because it aids in providing insulation (For Example: See Paragraph 37).

Additionally, since Applicant's Prior Art Drawings and Park are both from the same field of endeavor, the purpose disclosed by Park would have been recognized in the pertinent art of Applicant's Prior Art Drawings.

In regards to claim 22, Applicant's Prior Art Drawings fail to disclose the following:

a) sealed confronting surface is entirely sealed.

However, Fukui discloses a sealed confronting surface (For Example: See Figure 1). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Applicant's Prior Art Drawings to include a sealed confronting surface as disclosed in Fukui because it aids in permitting a second device to be mounted (For Example: See Column 5 Lines 5-13, Column 6 Lines 27-58).

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Additionally, since Applicant's Prior Art Drawings and Fukui are both from the same field of endeavor, the purpose disclosed by Fukui would have been recognized in the pertinent art of Applicant's Prior Art Drawings.

In regards to claim 23, Applicant's Prior Art Drawings fail to disclose the following:

- a) a semiconductor device mounted on a second semiconductor device.

However, Fukui discloses two semiconductor devices mounted on each other (For Example: See Figure 1). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Applicant's Prior Art Drawings to include two semiconductor devices mounted on each other as disclosed in Fukui because it aids in increasing the memory density (For Example: See Column 1 Lines 44-46).

Additionally, since Applicant's Prior Art Drawings and Fukui are both from the same field of endeavor, the purpose disclosed by Fukui would have been recognized in the pertinent art of Applicant's Prior Art Drawings.

In regards to claim 24, Applicant's Prior Art Drawings fail to disclose the following:

- a) another semiconductor device has electrodes that are connected to said wiring of the semiconductor device.

However, Fukui discloses two semiconductor devices that are connected (For Example: See Figures 1, 9a and 9b). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Applicant's Prior Art Drawings to include two semiconductor devices that are connected as disclosed in Fukui because it aids in providing an connection among the various components (For Example: See Figures 1, 9a and 9b).

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Additionally, since Applicant's Prior Art Drawings and Fukui are both from the same field of endeavor, the purpose disclosed by Fukui would have been recognized in the pertinent art of Applicant's Prior Art Drawings.

In regards to claim 25, Applicant's Prior Art Drawings fail to disclose the following:

a) semiconductor device is mounted on another semiconductor device with said confronting surface as a contacting surface, and said another semiconductor device has electrodes that are connected to said wiring and to at least one of said plurality of electrodes.

However, Fukui discloses two semiconductor devices mounted on each other with said confronting surface as a contacting surface and another semiconductor device has electrodes (For Example: See Figures 1, 9a and 9b). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Applicant's Prior Art Drawings to include two semiconductor devices mounted with said confronting surface as a contacting surface and another semiconductor device has electrodes as disclosed in Fukui because it aids in providing an connection among the various components (For Example: See Figures 1, 9a and 9b).

Additionally, since Applicant's Prior Art Drawings and Fukui are both from the same field of endeavor, the purpose disclosed by Fukui would have been recognized in the pertinent art of Applicant's Prior Art Drawings.

6. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Prior Art Drawings in view of Fukui et al. (U.S. Patent No. 6,100,594), Park et al. (U.S. Publication No. 2002/0089043) and Mori (U.S. Patent No. 5,903,049).

In regards to claim 21, Applicant's Prior Art Drawings disclose the following:

a) sealed bump electrode is resin sealed (For Example: See Specification Page 2 Lines 1 and 2).

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In regards to claim 21, Applicant's Prior Art Drawings fail to disclose the following:

a) surface is resin sealed.

However, Mori discloses the use of resin (For Example: See Figure 1). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Applicant's Prior Art Drawings to include the use of resin as disclosed in Mori because it aids in protecting the elements from the surrounding environment (For Example: See Column 2 Lines 57 and 58).

Additionally, since Applicant's Prior Art Drawings and Mori are both from the same field of endeavor, the purpose disclosed by Mori would have been recognized in the pertinent art of Applicant's Prior Art Drawings.

7. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Prior Art Drawings in view of Fukui et al. (U.S. Patent No. 6,100,594), Park et al. (U.S. Publication No. 2002/0089043) and Ball (U.S. Patent No. Re. 36,613).

In regards to claim 26, Applicant's Prior Art Drawings fail to disclose the following:

a) another semiconductor device is disposed over a plurality of other semiconductor devices.

However, Ball discloses a semiconductor device disposed over other devices (For Example: See Figure 2). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Applicant's Prior Art Drawings to include a semiconductor device disposed over other devices as disclosed in Ball because it aids in increasing the device density (For Example: See Column 1 Lines 9-12).

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Additionally, since Applicant's Prior Art Drawings and Ball are both from the same field of endeavor, the purpose disclosed by Ball would have been recognized in the pertinent art of Applicant's Prior Art Drawings.

8. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Prior Art Drawings in view of Fukui et al. (U.S. Patent No. 6,100,594), Park et al. (U.S. Publication No. 2002/0089043) and Ohuchi et al. (Japan Patent No. 10-261753).

In regards to claim 27, Applicant's Prior Art Drawings fail to disclose the following:

a) a part of said ball electrode is disposed on said wiring.

However, Ohuchi et al. ("Ohuchi") discloses a ball electrode on wire (For Example: See Figure 1). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Applicant's Prior Art Drawings to include a ball electrode disposed on wire as disclosed in Ohuchi because it aids in providing communication among the various components (For Example: See Figure 1).

Additionally, since Applicant's Prior Art Drawings and Ohuchi are both from the same field of endeavor, the purpose disclosed by Ohuchi would have been recognized in the pertinent art of Applicant's Prior Art Drawings.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Monica Lewis whose telephone number is 703-305-3743.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on 703-308-4905. The fax phone number for the organization where this application or proceeding is assigned is 703-308-7722 for regular and after final

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communications. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

ML

December 1, 2003


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